IN THE SPECIFICATION

Please replace the paragraph beginning at page 6, line 1 with the following amended paragraph:

Therefore, measuring the wave-front aberration according to the prior art Shack-Hartmann technique has a limit to improving the accuracy in measuring the wave-front aberration because of the possibility of cross talk between ~~order terms~~ orders where, when the wave-front aberration is expanded in a basis (or series), the aberration component of an order blends into the aberration component of another order in the measuring result.

Please replace the paragraph beginning at page 6, line 23 with the following amended paragraph:

According to a first aspect of the present invention, there is provided a wave-front aberration measuring method with which to measure wave-front aberration of an optical system, the measuring method comprising measuring aberration components of a first set of orders out of a plurality of aberration components obtained by expanding the wave-front aberration of the optical system using a predetermined basis; calculating correction information for aberration components of a second set of orders based on aberration ~~components of predetermined orders~~ component of a predetermined order out of the measured aberration components of the first set of orders; measuring aberration components of the second set of orders of the optical system; and correcting the result of the measuring of aberration components of the second set of orders based on the correction information. Here, the number of orders composing the set may be one, not being limited to more than one. That is, for example, the first set of orders may consist of one order or a

plurality of orders. Herein, the word "set" has such meaning.

Please replace the paragraph beginning at page 7, line 17 with the following amended paragraph:

According to this, first, aberration components of a first set of orders are measured, for example, upon making the optical system, when it is possible to very accurately measure higher-order, as well as lower-order, terms of a predetermined basis (series) in which the wave-front aberration is expanded, because enough time can be spent on measurement and restriction on measurement resources provided is little. Correction information for aberration components of a second set of orders to be measured later is calculated based on ~~a predetermined order term's~~ aberration component of a predetermined order out of the aberration components of the first set of orders measured

Please replace the paragraph beginning at page 8, line 20 with the following amended paragraph:

Table 1 shows functions $f_i(\rho,\theta)$ (i = 1 through 36) in the expression (1). The wave-front (aberration) is expanded in Zernike polynomials, each of which expresses an n'th order $m\theta$ term that is a product of an n'th order polynomial including radial distance ρ to the n'th power and a trigonometric function of angular coordinate θ multiplied by m, and in the expansion in fringe Zernike polynomials, terms are arranged in ascending order of the sum (n + m) and, when values of the sum are the same, in ascending order of n. The value of i in the expression (1) denotes an order in the expansion in fringe Zernike polynomials. Incidentally, coefficients of higher than first orders and not coefficient Z_1 of the first order are measured in the measurement of wave-front aberration according to the

Shack-Hartmann technique.

Please replace the paragraph beginning at page 10, line 7 with the following amended paragraph:

In the wave-front aberration measuring method according to this invention, the predetermined ~~orders~~ order may be included in the first set of orders and not included in the second set of orders; calculating the correction information may comprise calculating a first wave-front in which aberration components of other orders than the predetermined ~~orders~~ order out of the measured first set of orders are zero and calculating as the correction information respective correction amounts for aberration components of the second set of orders based on a model for a measuring system that measures aberration components of the second set of orders and on the first wave-front, and in correcting based on said correction information, the measured aberration components of the second set of orders may be individually corrected.

Please replace the paragraph beginning at page 10, line 23 with the following amended paragraph:

In the wave-front aberration measuring method according to this invention, the predetermined ~~orders~~ order may be included in the first set of orders and not included in the second set of orders; calculating the correction information may comprise calculating as the correction information a first wave-front in which aberration components of other orders than the predetermined ~~orders~~ order out of the measured first set of orders are zero, and correcting based on the correction information may comprise calculating a second wave-front that has aberration components of the second set of orders measured by a

measuring system that measures aberration components of the second set of orders, calculating a third wave-front by correcting the second wave-front based on the first wave-front and calculating corrected aberration components of the second set of orders, based on the third wave-front and a model for the measuring system.

Please replace the paragraph beginning at page 12, line 7 with the following amended paragraph:

According to a second aspect of the present invention, there is provided a wave-front aberration measuring apparatus which measures wave-front aberration of an optical system, the measuring apparatus comprising a storage unit that stores correction information for aberration components of a second set of orders, the correction information being calculated based on aberration ~~components of predetermined orders~~ component of a predetermined order out of aberration components of a first set of orders out of a plurality of aberration components obtained by expanding the wave-front aberration of the optical system using a predetermined basis; a measuring system that measures aberration components of the second set of orders of the wave-front aberration of the optical system; and a correcting unit coupled to the storage unit and the measuring system, which corrects the measuring result of the measuring system using the correction information.

Please replace the paragraph beginning at page 12, line 23 with the following amended paragraph:

According to this, a correcting unit corrects aberration components of a second set of orders measured by a measuring system with calculated correction information for aberration components of the second set of orders based on ~~a predetermined orders term's~~

aberration component of a predetermined order out of aberration components of a first set of orders measured before. That is, the wave-front aberration measuring apparatus of this invention measures the wave-front aberration of the optical system using the wave-front aberration measuring method, so that the wave-front aberration can be accurately measured.

Please replace the paragraph beginning at page 13, line 10 with the following amended paragraph:

Further, in the wave-front aberration measuring apparatus according to this invention, the measuring system may comprise a wave-front dividing device positioned to divide wave-front of light having passed through the optical system to form images of a plurality of ~~pattern~~ patterns; and an aberration-component calculating unit coupled to the correcting unit, which calculates aberration components of the second set of orders, based on positions of the ~~mages~~ images of the plurality of patterns

Please replace the paragraphs which were previously inserted at page 15, line 3 with the following amended paragraphs at page 15, line 7:

According to a sixth aspect of the present invention, there is provided a wave-front aberration measuring method with which to measure wave-front aberration of a projection optical system that projects a pattern onto a substrate, the measuring method comprising: measuring aberration components of a second set of orders out of aberration components of a first set of orders included in wave-front aberration of the projection optical system; and correcting the measured aberration components of the second set of orders based on a predetermined ~~orders~~ order that ~~are~~ is included in aberration components of the first set of orders and not included in aberration components of the second set of orders.

According to a seventh aspect of the present invention, there is provided a wave-front aberration measuring apparatus which measures wave-front aberration of a projection optical system that projects a pattern onto a substrate, the measuring apparatus comprising: a measuring system arranged in the projection optical system, which measures aberration components of a second set of orders out of aberration components of a first set of orders included in wave-front aberration of the projection optical system; and a correcting unit coupled to the measuring system, which corrects the measured aberration components of the second set of orders based on a predetermined ~~orders~~ order that ~~are~~ is included in aberration components of the first set of orders and not included in aberration components of the second set of orders.

Please replace the paragraph beginning at page 29, line 5 with the following amended paragraph:

In the actual making of the projection optical system PL, measuring the aberration components of the second through N'th ~~order terms~~ orders and, based on the measuring result, adjusting for the wave-front aberration are repeated, so that the wave-front aberration characteristic of the projection optical system PL is finally adjusted to be a desired one. The aberration components $Z0_{j,2}$ through $Z0_{j,N}$ measured in the step 121 and used in later steps are ones after the final adjustment. Aberration components of higher than N'th ~~order terms~~ orders exist in practice, but are assumed to be negligible. For example, in the case of lenses usually used in the projection optical system PL, because of their shape, aberration components of higher ~~order terms~~ orders than the highest order ~~term~~ of the wave-front aberration measured in the making of the projection optical system PL are small enough for the assumption to be true.